Hansen's Disease

(Also known as Leprosy)

Section 1:

ABOUT THE DISEASE

A. Etiologic Agent

Hansen's disease (also called leprosy) is a chronic infectious disease caused by the bacterium *Mycobacterium leprae.*

B. Clinical Description

The disease manifests along a clinical spectrum between two forms: lepromatous and tuberculoid leprosy. Borderline leprosy has features of both, with a tendency to shift toward the lepromatous form in the untreated patient and toward the tuberculoid form in the treated patient. Indeterminate leprosy is an early form that may develop into any of the other forms.

Lepromatous	The lepromatous form of leprosy usually exhibits extensive and bilaterally symmetrical skin nodules, papules, and macules, as well as diffuse infiltration of the face, hands, and feet. Nasal mucosa and ocular involvement may lead to obstructed breathing and eye inflammation.
Tuberculoid Leprosy	The tuberculoid form of leprosy usually exhibits a limited number of well-demarcated skin lesions with spreading edges and a clearing center. The lesions are anesthetic or hypesthetic (have absent or reduced sensation) and are bilaterally asymmetrical. Significant peripheral nerve involvement may occur. Loss of sensation resulting from nerve involvement can lead to serious consequences, including ulcerations, fractures, and bone resorption.

C. Vectors and Reservoirs

Humans are the only reservoir of proven significance for leprosy. There have been reports suggesting that leprosy in armadillos may be naturally transmitted to humans.

D. Modes of Transmission

The exact mechanism for the acquisition and transmission of leprosy is not known. However, household contact and prolonged close contact may result in transmission. Large numbers of the organism are shed in the nasal discharge of untreated patients with lepromatous leprosy, and the bacilli may remain viable in dried nasal secretions for at least seven days. Large numbers of bacilli are also shed in the skin lesions in the lepromatous form of leprosy.

E. Incubation Period

The incubation period is unclear but seems to range from nine months to twenty years.

F. Period of Communicability or Infectious Period

The infectious period depends on the type of leprosy and treatment. This can range from a few days to up to three months, and it is questionable whether the tuberculoid form of leprosy is infectious at all.

G. Epidemiology

During 2002, 620,000 persons were diagnosed with leprosy worldwide, with Brazil, India, Madagascar, Mozambique, Tanzania, and Nepal reporting 90% of the cases. Cases in the U.S. are rare; only 96 cases were reported in 2002 in the U.S. Additionally, cases in the U.S. typically occur in immigrants or refugees whose disease was acquired in their native countries. However, there are pockets of endemicity in California, Hawaii, Louisiana, Texas, and Puerto Rico. Although leprosy affects people of all ages and gender, cases in individuals under three years of age are rare.

Worldwide, 1–2 million people are permanently disabled as a result of leprosy. Those receiving antibiotic treatment or having completed treatment are considered free of active infection.

H. Bioterrorist Potential

This pathogen is not considered to be of risk for use in bioterrorism.

Section 2:
REPORTING CRITERIA AND LABORATORY TESTING

A. What to Report to the Massachusetts Department of Public Health (MDPH)

Report any case with demonstration of acid-fast bacilli in skin or dermal nerve obtained from a full-thickness skin biopsy.

Note: See Section 3C for information on how to report a case of Hansen's disease.

B. Laboratory Testing Services Available

The MDPH State Laboratory Institute (SLI) can detect *M. leprae* by AFB smear microscopy of skin biopsy specimens. Although it is not possible to grow *M. leprae* in either bacteriological or in cell culture, further testing of specimens using DNA amplification techniques may be coordinated between the SLI and the Centers for Disease Control and Prevention (CDC).

For more information about testing, call the SLI Mycobacteriology Laboratory at (617) 983-6381.

Section 3:

REPORTING RESPONSIBILITIES AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify infection and possible modes of acquisition.

B. Laboratory and Health Care Reporting Requirements

Hansen's disease (leprosy) is reportable to the local board of health (LBOH). The MDPH requests that health care providers immediately report to the LBOH in the community where the case is diagnosed, all confirmed or suspect cases of Hansen's disease, as defined by the reporting criteria in Section 2A.

Laboratories performing examinations on any specimens derived from Massachusetts residents that yield evidence of Hansen's disease infection shall report such evidence of infection directly to the MDPH within 24 hours.

C. Local Board of Health (LBOH) Reporting and Follow-Up Responsibilities

Reporting Requirements

MDPH regulations (*105 CMR 300.000*) stipulate that Hansen's disease is reportable to the LBOH and that each LBOH must report any case of Hansen's disease or suspect case of Hansen's disease, as defined by the reporting criteria in Section 2A. Cases should be reported to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS) using an official MDPH *Hansen's Disease Case Report Form* (found at the end of this chapter). Refer to the *Local Board of Health Timeline* at the end of this manual's *Introduction* section for information on prioritization and timeliness requirements of reporting and case investigation.

Case Investigation

1. It is the responsibility of the LBOH to complete a MDPH *Hansen's Disease Case Report Form* (found at the end of this chapter) by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the health care provider or from the medical record.

2. Use the following guidelines to assist in completing the form:

   a. Accurately record the demographic information, dates of symptom onset and first diagnosis, and the type of leprosy. Because most cases of leprosy in Massachusetts are among immigrants, there is a strong possibility that the case was previously diagnosed and possibly treated in his/her native country.

   b. Ask questions about contact with armadillos because a disease identical to leprosy affects these animals, and there have been reports suggesting that feral armadillos in Louisiana and Texas have transmitted the disease to humans.

   c. Complete information about the diagnosis and current treatment. Ask questions about diagnosis to determine if the case is confirmed.

   d. Ask questions about residence (e.g., living outside the U.S.) and place of birth to determine if a person has resided or was born in a country endemic for leprosy. Complete the residence history as fully as possible.

   e. Ask about household contacts and other contacts to determine the possible source of infection as well as whether others have been exposed.

f. If you have made several attempts to obtain case information but have been unsuccessful (e.g., the case or health care provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as you have gathered. Please note on the form the reason(s) why it could not be filled out completely.

3. After completing the form, attach laboratory report(s) and fax or mail (in an envelope marked "Confidential") to ISIS. The confidential fax number is (617) 983-6813. Call ISIS at (617) 983-6801 to confirm receipt of your fax. The mailing address is:

MDPH, Office of Integrated Surveillance and Informatics Services (ISIS)
305 South Street, 5th Floor
Jamaica Plain, MA 02130
Fax: (617) 983-6813

4. Institution of disease control measures is an integral part of case investigation. It is the responsibility of the LBOH to understand, and if necessary, institute the control guidelines listed in Section 4.

Section 4:
CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements *(105 CMR 300.200)*

Minimum Period of Isolation of Patient

No restrictions if under medical care.

Minimum Period of Quarantine of Contacts

No restrictions.

B. Protection of Contacts of a Case

Handwashing is recommended for all contacts of lepromatous cases and disinfection of nasal discharges of the case should be considered during the infectious period. Periodic examination of household and other contacts should occur annually for five years after the last contact with an infectious case.

C. Managing Special Situations

Response to Community Perceptions

Community and individual perceptions about leprosy may reflect inaccurate concerns about communicability and about the health implications for those diagnosed. These concerns may not be valid with regard to the nature of the disease, treatment, and prevention methods. It is important to convey to all concerned parties, the low communicability of this disease and the availability of effective treatment and prevention regimens. Similarly, it is important to strictly enforce confidentiality of case information; information should be released only to appropriate agencies and individuals who need to know, and to the greatest extent possible, with the knowledge and consent of the case.

D. Preventive Measures

Education of the case should stress the availability and efficacy of therapy. Additionally, education of the case's household contacts (as identified on the line listing in the surveillance form; see Section 3C for more information) should include modes of transmission and referral to a health care provider for follow-up.

It is important to convey to the case and to the contacts the very low communicability of this disease and the availability of effective treatment and prevention regimens.

ADDITIONAL INFORMATION

The following is the formal CDC surveillance case definition for Hansen's disease. It is provided for your information only and should not affect the investigation or reporting of a case that fulfills the criteria in Section 2A of this chapter. (The CDC and the MDPH use the CDC case definitions to maintain uniform standards for national reporting.) For reporting a case to the MDPH, always use the criteria outlined in Section 2A.

Note: The most up-to-date CDC case definitions are available on the CDC website at www.cdc.gov/epo/dphsi/casedef/case_definitions.htm.

Clinical Description

A chronic bacterial disease characterized by the involvement primarily of skin as well as of peripheral nerves and the mucosa of the upper airway. Clinical forms of Hansen's disease represent a spectrum reflecting the cellular immune response to *M. leprae*. The following characteristics are typical of the major forms of the disease:

Tuberculoid	One or a few well-demarcated, hypopigmented, and anesthetic skin lesions, frequently with active, spreading edges and a clearing center; peripheral nerve swelling or thickening also may occur.
Lepromatous	A number of erythematous papules and nodules or an infiltration of the face, hands, and feet, with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin.
Borderline (Dimorphous)	Skin lesions characteristic of both the tuberculoid and lepromatous forms.
Indeterminate	Early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features.

Laboratory Criteria For Diagnosis

Demonstration of acid-fast bacilli in skin or dermal nerve obtained from the full-thickness skin biopsy of a lepromatous lesion.

Case Classification

Confirmed	A clinically compatible case that is laboratory-confirmed.

REFERENCES

American Academy of Pediatrics. [Leprosy.] In: Pickering L.K., ed. *Red Book: 2003 Report of the Committee on Infectious Diseases, 26th Edition.* Elk Grove Village, IL, American Academy of Pediatrics; 2003: 401–403.

Centers for Disease Control and Prevention. Case Definitions for Infectious Conditions Under Public Health Surveillance. *MMWR*. 1997; 46(RR-10).

"Hansen's Disease (Leprosy)." Centers for Disease Control and Prevention. October 12, 2005. <www.cdc.gov/ncidod/dbmd/diseaseinfo/hansens_t.htm>.

Heymann, D., ed. *Control of Communicable Diseases Manual, 18th Edition.* Washington, DC, American Public Health Association, 2004.

Jacobson, R., Krahenbuhl, J. Leprosy. *The Lancet*. 1999; 353: 655–60.

"Leprosy: The Disease." World Health Organization. November 2004. <www.who.int/lep/disease/disease.htm>.

MDPH. *Regulation 105 CMR 300.000: Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements*. MDPH, Promulgated November 4, 2005.

FORMS & WORKSHEETS

Hansen's Disease
(Also known as Leprosy)

Hansen's Disease

(Also known as Leprosy)

LBOH Action Steps

This form does not need to be submitted to the MDPH with the case report form. It is for LBOH use and is meant as a quick-reference guide to Hansen's disease case investigation activities.

LBOH staff should follow these steps when Hansen's disease is suspected or confirmed in the community. For more detailed information, including disease epidemiology, reporting, case investigation, and follow-up, refer to the preceding chapter.

- ❑ Obtain laboratory confirmation.
- ❑ Identify other potentially exposed persons.
- ❑ Fill out the case report form (attach laboratory results).
- ❑ Send the completed case report form (with laboratory results) to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS).